

Research Article

Management Staff Adoption of Data Security Management Techniques for Fraud Prevention in Tertiary Educational Institutions in Bauchi State, Nigeria

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Abstract

This study ascertained management staff adoption of data security management techniques for fraud prevention in tertiary educational institutions in Bauchi State, Nigeria. Two research questions guided the study and two null hypotheses were tested. Descriptive survey research design was adopted for the study. The population comprised 696 management staff working in the six public tertiary educational institutions in Bauchi State, Nigeria. No sample was used because the population size was manageable for the researchers. A 21-items structured questionnaire was used. The instrument was validated by three experts. Cronbach's alpha was used to determine the reliability co-efficient values of 0.88 and 0.79, for clusters B1 and B2 with an overall co-efficient value of 84. Mean and standard deviation were used to answer the research questions, while analysis of variance was used to test the null hypotheses at 0.05 alpha levels. The findings of the study revealed that management staff agreed they adopt data control technology and data classification management techniques for fraud prevention in tertiary educational institutions in Bauchi State, Nigeria. Management staff years of working experience significantly influenced their mean ratings on the adoption of data control technology technique for fraud prevention in tertiary educational institutions in Bauchi State, Nigeria. While do not significantly do not influence their mean ratings on the adoption of data classification management techniques for fraud prevention. The study concluded that all the data security management techniques listed in the study is adopted by management staff for fraud prevention in tertiary educational institutions in Bauchi State, Nigeria. It was recommended among others that tertiary educational institution in Nigeria and Bauchi State in particular should be aware of the high rate of fraud in the environment and review their data security management techniques to reduce giving cyber criminals' opportunity to hack into the institutions' database to carry out fraud.

Keywords: Tertiary Educational Institutions, Data Security Management Techniques, Management Staff, Fraud Prevention.

Introduction

Tertiary educational institution is the apex of teaching, learning and research engagements in the education sector of a nation. They are also known as higher education, tertiary education, third stage, and post-secondary education. Holistically, Akpotohwo and Ogeibiri (2018) posited that tertiary education institution comprises of undergraduate and post-graduate academic programmes of universities, polytechnics, colleges of education and monotechnics that provide higher educational guidance, orientation and training. According to the Federal Republic of Nigeria, (FRN, 2013), the goals of tertiary education institution encompass the development of relevant high level manpower, development of intellectual capability of individuals and acquisition of physical and intellectual skills. Tertiary educational institutions provide formal type of education with organized teaching and learning experiences in universities, polytechnics, colleges of education and among others. Tertiary educational institutions in Nigeria face numerous challenges in their efforts to provide quality education to the Nigerian populace. Some of these challenges include; poor funding, poor teaching and learning facilities, inadequate manpower and most especially fraud. Fraud is intentional deception to secure unfair or unlawful gain, or to deprive a victim of a legal right. Fraud can violate civil law or criminal law, or it may cause no loss of money, property, or legal right but still be an

element of another civil or criminal wrong. According to Association of Certified Fraud Examiners (2017), fraud is the deliberate misrepresentation of the truth or the suppression of a material fact in order to persuade another person to act injuriously.

In Nigeria, fraud is rampant in every industry, including banking, healthcare, energy, housing and education (Okoye *et al.*, 2017). Fraud has also slowed the expansion of Nigeria's education delivery. An education system plagued by fraud is likely to produce dishonest public officials, incompetent leaders, inexperienced instructors, quack physicians, technologists and technicians (Ile and Odimegwa, 2018). The majority of Nigeria's educational institutions do not appear to understand how fraud affects their ability to maintain financial stability and builds public distrust. In light of this, Amesi and Akpomi (2008) claimed that fraud in Nigerian tertiary education institutions has eluded all existing remedies. Both academic and non-academic employees, such as lecturers, senior staff, staff members of alumni offices, staff members of the bursary/treasury, staff members of institution project centers, public relations units, and other revenue-generating departments, are capable of committing fraud. Management staff are also officials, directors, and administrators includes; improper contract awarding, misappropriation of funds, admissions offered on the basis of financial need, and diverting research grants or other funds designated for projects into personal accounts.

In an attempt to arrest increasing cases of fraud in Nigerian tertiary educational institutions, the management staff of the institutions needs to play a crucial role in the prevention of fraud by setting up and maintaining proper internal control systems that can offer security and accountability for the data entrusted to them. They are also required to understand the dangers and exposures associated with the vast amounts of frequently private data that tertiary institutions gather and disseminate. Due in large part to improvements in technology, expansion of communication, the internet and the cost of data storage, the amount of data being stored in tertiary institutions is increasing exponentially (Lewal, 2017). However, as data generation grows, so does the risk of data loss that Nigerian tertiary educational institutions must contend with. Because of the internet's rapid expansion, tertiary educational institutions may leave a lot of data footprints that give cybercriminals access to the educational institution's websites to gather information for their fraudulent schemes. Onaleye (2021) observed that despite the existence of the Nigeria Data Protection Regulation (NDPR, 2019), educational institutions and agencies in Nigeria, including the National Examination Council (NECO), Joint Admission and Matriculation Board (JAMB) and Gombe state university have reported data breaches, and have had to pay expensive repair costs in addition to fines and a general decline in public trust. Knoblauch and Foku (2017) noted that cybercriminals are now routinely targeting educational institutions in Nigeria. Song (2019) claimed that the Nigerian education sector was responsible for 13 percent of the data breaches that occurred in the first half of 2017 that led to the compromising of 32 million records.

Data are assets to tertiary educational institutions. International Data Corporation (2016) defined data as letters, symbols, and binary that a computer uses to carry out activities. Data may be stored or sent as electronic signals on any device or in any format. An educational institution may be the owner of the data it has, or it may be the custodian of data owned by another organization. Tertiary educational institutions provide a variety of data, including data on staff and students, data on healthcare (medical records and laboratory tests), and data on finances (Biddle, 2017). In order to safeguard data from the hazards of data breaches, Knoblauch and Foku (2017) claimed that data security management has grown to be one of the most urgent security concerns for management and employees of tertiary institutions.

Data security management is the process of safeguarding sensitive business data from cyber-attacks using multiple techniques, strategies, and practices. It's a crucial preemptive measure that protects digital assets such as documents, files, images, and other intellectual property from cyber-criminal activities. Strong data security management guarantees that crucial information for tertiary institutions is backed up and accessible should the main source become unavailable. If the institution's data include any personally identifiable information that must be properly handled to comply with the Nigeria Data Protection Regulation (NDPR), security management becomes even more crucial. Therefore, Office Technology and Management (OTM) departments teach data security management as a part of office application in Nigerian universities and polytechnics. Office application seeks to equip OTM students with office skills using a keyboard as an input device, working with computer excel, word processing, reprographics for documentation, office practice skills, and database administration among others (Bupo, 2016). OTM is a field of business education that gives students the knowledge and skills for data management (Oladunjoye, 2016). Due to the fact that data security is crucial for preventing fraud in tertiary educational institutions need to

create security procedures to safeguard their data all the way through its life cycle (NDPR, 2019). In accord, Unini (2019) noted that education institutions must make sure that all data are safeguarded from loss or unauthorized users in order to ensure operational efficiency and consistently match the expectations of the teeming public. Additionally, tertiary educational institutions must make sure that they fulfill their obligations honestly and without engaging in dishonest behaviour. However, Babatunde (2020) reported that there were documented instances of fraud in the educational system, and significant issues about its causes and prevention methods yet remain unsolved. The loss of data in tertiary educational institutions, could compromise people's privacy and expose sensitive information to the public. Additionally, it might make it harder for tertiary educational institution administrators to assign blame for staff members' acts and hold them accountable.

The process of assuring the identification of the source or sender of data, the integrity of the data, and the control of the identity of the destination or receiver is referred to as data security management (Ofori-Duodu, 2019). Tertiary educational institutions can use several data security management techniques to prevent fraud. Data security management techniques include the installation of firewalls, the use of data encryption technologies, the development of organizational policies for handling sensitive or confidential data, the protection of e-mailing systems, and the continual development of staff data security skills (NDPR, 2019). Data security compliance monitoring and data security auditing were identified as techniques for securing data for fraud prevention (Michael, 2020). Multiple-security-technology solutions, data security policies, device management policies, and data classification was proposed by (Al-Edwan, 2016). However, the adoption of data control technology techniques and data classification management techniques for fraud prevention in tertiary educational institutions were evaluated in this study. To secure data, data control technologies employ disk encryption, backup, data masking, data erasure, firewalls, intrusion detection devices, honeypots, antivirus, proxy servers, and tripwire to prevent unwanted access. Oni (2016) stated that deploying data control technologies to secure data on all of the institutions' computers, e-mail and network end points can help to avoid hackers and their attacks. Yusof *et al.*, (2021) stated that internal control and technology adoption have a significant positive effect on banks' protection of customers' data security. Onaleye (2021) reported that user name and password were the most important strategies to authenticate the nurses, with mean percent of 95 percent and 80 percent, respectively, and also the most significant level of information security protection were assigned to administrative and logical controls. Onaleye further revealed there is no significant difference between opinions of both groups studied about the levels of information security protection and security requirements based on their years of work experience.

The tertiary educational institution's data are analyzed to determine their worth and importance before being classified using a data classification management technique. Data classification involves examining structured or unstructured data and classifying it according to the file type, and contents (Petters, 2021). Top-secret information must be classified in order to appropriately handle them. According to Eck (2019), data classification enables tertiary educational institutions to determine the business value of unstructured data at the time of creation, distinguish valuable data from less valuable data that may be targeted, and make educated decisions about how to allocate resources to secure data from unauthorized use. Users can be reminded to consider their actions and act more cautiously when handling data by using visual labels and watermarks like confidential. Data classification management techniques can help to improve the documentation and destruction of data. Bergquist *et al.*, (2021) stated that it is necessary to educate the employees about the basics of information security and classification and create an understandable and unified information security language. Ashaikh *et al.*, (2018) noted that there is high information security plans, information security awareness, perceived quality training programmes, information classification, information security policies and procedures for classification process. Oladunjoye (2016) revealed that experienced managers have over the years developed effective techniques for securing classification in their organizations' data when compared with the less experienced managers. In order to prevent fraudsters from accessing their data, management of tertiary educational institutions must work with management staff that handles day-to-day data management tasks to audit their IT infrastructure, including their computers, networks, and mobile devices. The management staff could benefit from this partnership.

Management staff are individuals who are in charge of overseeing the work of others, and include administrators, directors, managers, leaders and supervisors, team leaders, and anyone else acting in a leadership capacity. Management staffs are indispensable employees in public tertiary educational institutions as they ensure that new innovations are implemented in tertiary educational institutions. They also work to ensure smooth operations of tertiary educational institutions and set up internal control

systems to prevent fraud occurring in their tertiary educational institutions. In view of this, the management staff ensures that staffs that handle data management tasks such as data documentation, organizing, managing data, managing inventory of assets and supplies, coordinating between data of departments and operating units perform their functions diligently to mistakes that will lead to data breach (Babatunde, 2020). The management staff could be individuals with different educational qualifications and working experiences, and are expected to possess competencies required to adopt data security management techniques for prevention of fraud in their offices.

Management staff members must implement suitable data security management strategies. However, problems with financial scandals, corruption, purposeful data destruction after misappropriation of funds to cover up the case, ongoing data loss by staff, and hacking of crucial information (data) of both the federal and state tertiary educational institutions in Nigeria suggest that these techniques are not widely adopted for fraud prevention. Management staff with above 10 years working experience could be adopting data security management techniques on account of having attended more trainings and re-training programmes, workshops, data security summits and other data security management programmes within and outside the country than staff with 1-5 years, and those with 6-10 years working experience. It could also be that experienced management staff possess more data security management techniques as the case may be compared to less experienced ones. Oladunjoye (2016) in agreement observed that experienced managers have over the years developed effective techniques for securing their organizations' data when compared with the less experienced managers. This could be attributed to exposure to different data security management techniques during course of learning. Generally, management staff embark on more training and development programmes to up-date their knowledge and skills and to improve on their jobs. In view of the high rate at which fraud is being perpetuated in tertiary institutions in Nigeria, there is need for this study to ascertain the adoption of data security management techniques for fraud prevention by management staff in tertiary educational institutions in Bauchi State, Nigeria.

Statement of the Problem

There are many data security management techniques that tertiary educational institutions in Nigeria can adopt to reduce the likelihood of fraud. However, the evidence that is now available indicates that some tertiary educational institutions in Nigeria, including those in Bauchi state, have embraced some of these techniques, including data mining, the use of passwords, activating fire walls, utilizing antivirus and antispyware, and the use of secure records scanning. As indicated by the daily reports of data theft, loss, and damages that continue to expose the private data of tertiary educational institutions to the public, it appears that management staff may not be adopting most of these tactics in order to secure data in their offices. The researcher is worried that the inability of management staff of tertiary educational institutions in Nigeria, especially in Bauchi state to adopt data security management techniques will worsen the incidence of data privacy breaches that expose the institutions' confidential information to the general public, therefore giving cyber criminals opportunity to hack into the institutions' database to carry out fraud. Management staff could also make it impossible to prevent fraud in tertiary educational institutions which are increasingly committed through computer database. However, the adoption of data security management techniques by management staff of tertiary educational institutions in Bauchi State, Nigeria seems not to be revealing. Hence, this study is imperative as it will reveal the data security management techniques adopted by management staff of tertiary educational institutions for fraud prevention in Bauchi State, Nigeria.

Purpose of the Study

The main purpose of this study was to ascertain management staff adoption of data security management techniques for fraud prevention in tertiary educational institutions in Bauchi State, Nigeria. Specifically, this study sought ascertain the:

- 1) Data control technologies adopted for fraud prevention by management staff in tertiary educational institutions in Bauchi State, Nigeria.
- 2) Data classification management technique adopted for fraud prevention by management staff in tertiary educational institutions in Bauchi State, Nigeria.

Research Questions

The following research questions guided this study:

- 1) What is the data control technology technique adopted for fraud prevention by management staff in tertiary educational institutions in Bauchi State, Nigeria?
- 2) What is the data classification management technique adopted for fraud prevention by management staff in tertiary educational institutions in Bauchi State, Nigeria?

Hypotheses

The following null hypotheses were tested at 0.05 level of significance:

- 1) There is no significant difference in the mean ratings of management staff on the adoption of data control technology techniques for fraud prevention in tertiary educational institutions in Bauchi State, Nigeria based on their years of working experience.
- 2) There is no significant difference in the mean ratings of management staff on the adoption of data classification management techniques for fraud prevention in tertiary educational institutions in Bauchi State, Nigeria based on their years of working experience.

Method

The study adopted descriptive survey design. The population of the study comprised 696 management staff working in the six public tertiary educational institutions in Bauchi State, Nigeria. All the 696 management staff working in the six public tertiary educational institutions in Bauchi State, Nigeria was used because the population sample is small. Data were collected using a 21-items structured questionnaire. The structured questionnaire was validated by three experts-two in Business Education of Department of Technology and Vocational Education and one in Measurement and Evaluation of Department of Educational Foundations all from Faculty of Education, Nnamdi Azikiwe University, Awka. Their comments enhanced the content validity of the instrument. To establish the internal consistency of the instrument, a trial-tested was conducted. Data collected in the pilot test were analyzed using Cronbach's alpha to determine the internal consistency.

Reliability coefficients values of 0.88 and 0.79 for clusters B1 and B2 respectively with an overall coefficient value of 0.84. Out of the 696 copies of the questionnaire distributed to the respondents in their organizations through direct approach which facilitated a response rate, 687 copies (representing 99 percent) were retrieved with an attrition rate of 12 copies (representing 1 percent) and used for data analysis. Data collected regarding the research questions were analyzed using mean and standard deviation while Analysis of Variance (ANOVA) was used to test the null hypotheses at 0.05 level of significance. In order to ascertain management staff adoption of data security management techniques for fraud prevention in tertiary educational institutions in Bauchi State, Nigeria, a decision rule based on real limit of numbers was used such that ratings between 4.50-5.00 were regarded as strongly agree, items with mean ratings of 3.50-4.49 were considered as agree; items with mean ratings of 2.50-3.49 were considered as undecided.

Furthermore, items with mean ratings of 1.50-2.49 and 1.00-1.49 were considered as disagree and strongly disagree respectively. In testing the null hypotheses, a null hypothesis was rejected where the calculated p-value is less than the 0.05 level of significance. Conversely, where the calculated p-value was greater than or equal to the level of significance (0.05), it meant that there was no significant difference and the null hypothesis is not rejected.

Results

Research Question 1

- 1) What is the data control technology technique adopted for fraud prevention by management staff in tertiary educational institutions in Bauchi State, Nigeria?

Data in Table 1 show that the item-by-item analysis reveals that out of 12 items listed, two of the items have mean scores of 4.51 each indicating strongly agree. Seven items have mean scores ranging from 3.51 to 4.48 as agree and the remaining three items disagree with mean scores ranging from 2.26 to 2.46. The standard deviations of 0.66 to 0.89 show that the respondents are not wide apart in their mean ratings. The grand mean scores of 3.75 shows that, on the whole, management staff in the area of the study agreed that they adopt data control technology technique for fraud prevention in tertiary educational institutions in Bauchi State, Nigeria.

Research Question 2

- 1) What is the data classification management technique adopted for fraud prevention by management staff in tertiary educational institutions in Bauchi State, Nigeria.

Data in Table 2 show that the item-by-item analysis reveals that out of nine items listed, one of the items had mean scores of 4.53 indicating strongly agree. Six items have mean scores that ranged from 3.70 to 4.36 as agree and the remaining two items disagree with mean scores ranged of 1.99 and 2.37. The standard deviations of 0.63 to 0.82 show that the respondents are not wide apart in their mean ratings. The grand mean scores of 3.77 shows that, on the whole, management staff in the area of the study agreed that they

adopt data classification management technique for fraud prevention in tertiary educational institutions in Bauchi State, Nigeria.

Table 1. Management staff mean ratings of data control technology technique adopted for fraud prevention in tertiary educational institutions in Bauchi State, Nigeria (N =687).

S/N	Data control technology technique adopted for fraud prevention includes:	\bar{x}	SD	Remarks
1	Authorized code or key to keep my office data confidential at rest, or in transit	3.51	0.84	Agree
2	External hard drive to save my office data for immediate recovery when lost or damaged	4.48	0.68	Agree
3	Computer start up keys to protect my office computer from unauthorized access	4.11	0.79	Agree
4	Eraser on windows to reliably delete (clear or wipe out) my office data from hard disks	2.36	0.87	Disagree
5	Security token (smart cards, and USB keys) to prevent authorized access to data stored in my office computers	4.42	0.72	Agree
6	Hiding original office sensitive data with random characters to render them useless for unauthorized users	2.26	0.89	Disagree
7	Flash drive to save my office data for immediate recovering when lost or damaged	3.57	0.82	Agree
8	User name and password to protect my office data from unauthorized access	4.51	0.66	Strongly agree
9	Security questions to restrict unauthorized access to my office sensitive data	2.46	0.86	Disagree
10	Matching fingerprint to protect data stored in my office computer from unauthorized access	4.42	0.72	Agree
11	Cloud storage to back up my office data	4.36	0.74	Agree
12	Antivirus to detect, and prevent virus infection of my office data	4.51	0.66	Strongly agree
Cluster mean		3.75		Agree

Table 2. Management staff mean ratings of data classification management technique adopted for fraud prevention in tertiary educational institutions in Bauchi State, Nigeria (N =687).

S/N	Data classification management technique adopted for fraud prevention includes:	\bar{x}	SD	Remarks
1	I protect high sensitive data to avoid significant legal liability or loss of customer trust	4.53	0.63	Strongly agree
2	Protection of very high sensitive data to avoid loss of financial trust	4.36	0.65	Agree
3	I protect medium sensitive data to avoid limited legal liability	4.31	0.67	Agree
4	I classify data in my office according to size	1.99	0.82	Disagree
5	I classify data in my office according to time of creation	3.70	0.74	Agree
6	I classify sensitive internal data to avoid disclosure that can negatively affect office operations	4.17	0.70	Agree
7	I protect confidential data (available to specific staff) in my office	2.37	0.78	Disagree
8	I protect internal data (available to only staff working within the department) in my office	4.17	0.70	Agree
9	I protect public data (available to anyone) in my office	4.36	0.65	Agree
Cluster mean		3.77		Agree

Hypothesis 1

There is no significant difference in the mean ratings of management staff on the adoption of data control technology techniques for fraud prevention in tertiary educational institutions in Bauchi State, Nigeria based on years of working experience (1-5 years, 6-10 years or above 10 years).

Table 3. Summary of analysis of variance on the mean ratings of management staff on the adoption of data control technology techniques for fraud prevention in tertiary educational institutions in Bauchi State, Nigeria based on their years of working experience (1-5 years, 6-10 years or above 10 years).

	Sum of squares	df	Mean square	F	P-value	Remarks
Between groups	160.300	2	80.150	7.491	.001	Significant
Within groups	2503.633	684	10.699			
Total	2663.933	686	-			

As shown in Table 3, the F-ratio (df: 2/684) is 7.491 and the P-value (.001) is less than the stipulated 0.05 level of significance (P-value < alpha level). It was therefore noted that there is a significant difference in the mean ratings of management staff on the adoption of data control technology techniques for fraud prevention in tertiary educational institutions in Bauchi State, Nigeria based on their years of working experience. Therefore, the null hypothesis is rejected.

Table 4. Scheffe post hoc test on the mean ratings of management staff on the adoption of data control technology techniques for fraud prevention in tertiary educational institutions in Bauchi State, Nigeria based on their years of working experience (1-5 years, 6-10 years or above 10 years).

Years of working experience	Years of working experience	Mean difference	P-value	Remarks
1-5 years	6-10 years	.16455*	.002	Significant
	Above 10years	-.10684*	.000	
6-10 years	1-5years	-.16455*	.002	
	Above 10years	-.19139*	.000	
Above 10 years	1-5 years	.10684*	.000	
	6-10 years	.19139*	.000	

As indicated by the Post-Hoc test (Scheffe test) in Table 4, there is a significant difference on the adoption of data control technology techniques for fraud prevention in tertiary educational institutions in Bauchi State, Nigeria by management staff who had 1-5 years of working experience and those who had 6-10 years of working experience and above 10 years working experience. There is also a significant difference between management staff that had 1-5 years of working experience and those that had 6-10 years of working experience.

Hypothesis 2

There is no significant difference in the mean ratings of management staff on the adoption of data classification management techniques for fraud prevention in tertiary educational institutions in Bauchi State, Nigeria based on years of working experience (1-5 years, 6-10 years or above 10 years).

Table 5. Summary of analysis of variance on the mean ratings of management staff on the adoption of data classification management techniques for fraud prevention in tertiary educational institutions in Bauchi State, Nigeria based on their years of working experience (1-5 years, 6-10 years or above 10 years).

	Sum of squares	df	Mean square	F	P-value	Remarks
Between groups	341.827	2	170.914	12.945	.059	Not Significant
Within groups	3089.439	684	13.203			
Total	3431.266	686	-			

As shown in Table 5, the F-ratio (df: 2/684) is 12.945 and the P-value (.059) is greater than the stipulated 0.05 level of significance (P-value > alpha level). It was therefore noted that there is no significant difference in the mean ratings of management staff on the adoption of data classification techniques for fraud prevention in tertiary educational institutions in Bauchi State, Nigeria based on their years of working experience. Therefore, the null hypothesis is not rejected.

Discussion of Findings

Findings of the study revealed that management staff in the area of the study agreed that they adopt data control technology technique for fraud prevention in tertiary educational institutions in Bauchi State, Nigeria. This implies that they disk encryption, backup, data masking, data erasure, firewalls, intrusion detection devices, honeypots, antivirus, proxy servers, and tripwire to prevent unwanted access in their institution data base. This finding is in line with Yusof *et al.*, (2021) who stated that internal control and

technology adoption have a significant positive effect on banks' protection of customers' data security. The findings agreed with Onaleye (2021) that user name and password were the most important strategies to authenticate the nurses, with mean percent of 95 percent and 80 percent, respectively, and also the most significant level of information security protection were assigned to administrative and logical controls. The findings of the study further revealed there is significant difference in the mean ratings of management staff on the data control technology techniques adopted for fraud prevention in tertiary educational institutions in Bauchi State, Nigeria based on educational qualification and years of working experience. This implies that they disk encryption, backup, data masking, data erasure, firewalls, intrusion detection devices, honeypots, antivirus, proxy servers, and tripwire to prevent unwanted access in their institution. The findings also disagree with Onaleye (2021) who revealed there is no significant difference between opinions of both groups studied about the levels of information security protection and security requirements based on their years of work experience. The reason for the dissimilarities in test of hypotheses is because the management staff inability to control the enormous volume of data they produce leads to data being hacked, damaged, lost, and destroyed on a daily basis. The reason for determining management staff adoption of data security management techniques for fraud prevention in tertiary institution is because they are in a better position to indicate whether they adopt data control technology techniques for fraud prevention in their offices.

Findings of the study revealed that management staff in the area of the study agreed that they adopt data classification techniques for fraud prevention in tertiary educational institutions in Bauchi State, Nigeria. This implies that they determine the business value of unstructured data at the time of creation, distinguish valuable data from less valuable data that may be targeted, and make educated decisions about how to allocate resources to secure data from unauthorized use in their institution. This finding is in line with Bergquist *et al.*, (2021) who stated that it is necessary to educate the employees about the basics of information security and classification and create an understandable and unified information security language. This finding agrees with Alshaikh *et al.*, (2018) who noted that there is high information security plans, information security awareness, perceived quality training programmes, information classification, information security policies and procedures for classification process. The findings of the study further revealed there is no significant difference in the mean ratings of management staffs on the data classification techniques adopted for fraud prevention in tertiary educational institutions in Bauchi State, Nigeria based on educational qualification and years of working experience. This finding agrees with Oladunjoye (2016) who revealed that experienced managers have over the years developed effective techniques for securing classification in their organizations' data when compared with the less experienced managers. The reason for the similarities in test of hypotheses is because they use data classification to improve the documentation and destruction of data. They are in a better position to indicate data security management techniques they are adopting for fraud prevention in their offices.

Conclusion

Based on the findings of the study, it is concluded that all the data security management techniques listed in the study are adopted by management staff for fraud prevention in tertiary institutions in Bauchi State, Nigeria.

Recommendations

Based on the findings and conclusion of the study, the following recommendations are made:

- 1) Tertiary educational institutions in Nigeria and Bauchi State in particular should be conscious of the high rate of fraud in the environment and review their data security management techniques to reduce giving cyber criminals' opportunity to hack into the institutions' database to carry out fraud.
- 2) Business and office education students should be revealed on how to minimize issues of data loss, damage, theft and privacy risks that can lead to cyber fraud. This could done by training and re-training of business and office education students and lecturers by IT administrators on data security management techniques for securing data which could enhance their academic and professional development.

Declarations

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References

1. Akpotohwo, C.F. and Ogeibiri, C. 2018. Business educators and students perception of funding impact on quality assurance in the business education programme in Niger Delta University, Bayelsa State. *International Journal of Advanced Research in Social Engineering and Development Strategies (IJARSEDs)*, 5(1): 54-62.
2. Al-Edwan, Z.S. 2016. The security education concepts in the textbooks of the national and civic education of the primary stage in Jordan: An analytical study. *International Education Studies*, 9(9): 146-156.
3. Alshaikh, M., Maynard, S.B. Ahmad, A. and Chang, S. 2018. An exploratory study of current information security training and awareness practices in organizations. *Proceedings of the 51st Hawaii International Conference on System Sciences*, 12th -15th September, 2018.
4. Amesi, J. and Akpomi, M.E. 2008. Fraud management in higher institutions in Rivers State. *Trends in Educational Studies*, 3(1): 107-114.
5. Association of Certified Fraud Examiner (ACFE), 2017. Report to the nations on occupational fraud and abuse. Austin, Texas: Association of Certified Fraud Examiners.
6. Babatunde, E.M. 2020. Fraud management and institutional performance of federal tertiary institutions workers in Nigeria. *International Journal of Innovative Research and Advanced Studies*, 7(6): 309-313.
7. Bergquist, J.H., Tinet, S. and Gao, S. 2022. An information classification model for public sector organizations in Sweden: A case study of a Swedish municipality. *Information and Computer Security*, 30(2): 153-172.
8. Biddle, S. 2017. Building security forces and stabilizing nations: The problem of agency. *Daedalus*, 146(4): 126-138.
9. Bupo, O.G. 2016. Availability and awareness of financing opportunities for small scale entrepreneurs in Rumuepirikom communities, Port Harcourt. *Association of Business Educators of Nigeria Conference Proceedings*, 3(1): 721-727.
10. Eck, T. 2019. 7 steps to effective data classification. Sirius Edge: <https://edge.siriuscom.com/security/7-steps-to-effective-data-classification>
11. Federal Republic of Nigeria. 2013. National policy on education. 6th Edition: NERDC Press.
12. Ile, C.M. and Odimmune, C.G. 2018. Use of forensic accounting techniques in the detection of fraud in tertiary institutions in Anambra State, Nigeria. *African Research Review*, 12(1): 66-76.
13. International Data Corporation, 2016. Worldwide big data and business analytics revenues forecast to reach \$187 billion in 2019, According to IDC.
14. Knoblauch, D. and Foku, F. 2017. European security certification framework: Continuous auditing certification scheme. Project Number: 731845.
15. Lawal, I. 2017. A nation weighed down by certificate scandals. <https://guardian.ng/features/a-nation-weighed-down-by-certificate-scandals/>
16. Michael, H. 2020. Exploring cyber security awareness and training strategies to protect information systems and data. Doctoral Thesis, College of Management and Technology, Walden University.
17. Nigerian Data Protection Regulation (NDPR). 2019. Implementation framework. Same sex marriage prohibition act, 2019.
18. Ofori-Duodu, M.S. 2019. Exploring data security management strategies for preventing data breaches. Unpublished Ph.D. Dissertation, College of Management and Technology, Walden University.

19. Okoye, E.I., Maimako, S.S., Jugu, Y.G. and Jat, R.B. 2017. Principles of fraud investigation on and forensic accounting. Awka: SCA Heritage Nigeria Ltd.
20. Oladunjoye, T.G. 2016. Optimizing business education for national development. Nigerian Journal of Business Education (NIGJBED), 3(1): 1-16.
21. Onaleye, T. 2021. Jamb isn't the first! here are 10 times Nigerian govt agencies have been hacked in the last decade. Retrieved from <https://technext.ng/2021/04/15/jamb-isnt-the-first-here-are-10-times-nigerian-govt-agencies-have-been-hacked-in-the-last-decade/>
22. Oni, J.A. 2016. Combating security challenges in the university system, ANUPA 2016. University of Lagos: Nigeria.
23. Petters, J. 2021. What is data classification? Guidelines and process: Inside out security. <https://www.varonis.com/blog/data-classification>
24. Song, V. 2019. Mother of all breaches exposes 773 million emails, 21 million passwords: Gizmodo.
25. Unini, C. 2019. UBA server hacked, flour mills' N752m stolen, bank's auditor tells court. Retrieved from <https://thenigerialawyer.com/uba-server-hacked-flour-mills-n752m-stolen-banks-auditor-tells-court/>
26. Yusof, M.H., Muhammad, K., Sabarudin, S.A. and Ghani, E.K. 2021. Can internal control, rules and regulations and technology adoption influence bank's protection of customers' data security. International Journal of Academic Research in Business and Social Sciences, 11(9): 1276-1290.

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